Claims

1. A semiconductor surface protecting method whereby the circuit side of a semiconductor wafer is protected during the step of back side grinding of the wafer, comprising:

joining the circuit side of said semiconductor wafer to a polymeric film material via a fluid surface protecting layer which hardens upon radiation exposure or heating, and

hardening said surface protecting layer.

2. A semiconductor surface protecting method whereby the circuit side of a semiconductor wafer is protected during the step of back side grinding of the wafer, comprising:

providing a surface protecting sheet comprising a polymeric film material on which is a surface protecting layer which is solid at room temperature, becomes fluid upon heating and hardens upon exposure to radiation or upon heating to a temperature higher than the fluidizing temperature,

heating said surface protecting sheet to make the surface protecting layer effectively fluid,

placing the circuit side of said semiconductor wafer in contact with the fluidized surface protecting layer, and

hardening said surface protecting layer.

3. A surface protecting sheet for protection of the circuit side of a semiconductor wafer during the step of back side grinding of the wafer, the surface protecting sheet comprising a polymeric film material on which is formed a surface protecting layer which is solid at room temperature, becomes fluid upon heating and hardens upon exposure to radiation or upon heating to a temperature higher than the fluidizing temperature.

4. A surface protecting sheet according to claim 3, wherein, before hardening of the surface protective layer, the protective layer has an elastic shear loss modulus (G") less than its elastic shear storage modulus (G') at room temperature (20-25°C) and an elastic shear loss modulus (G") greater than its elastic shear storage modulus (G') at 30-100°C, as measured with a viscoelasticity measuring apparatus at a frequency of 10 Hz, a deformation of 0.04% and a temperature ramp rate of 3°C/min., and the surface protective layer after hardening has an elastic tensile storage modulus (E') at 50°C greater than 5×10^7 Pa as measured with a viscoelasticity measuring apparatus at a frequency of 1 Hz, a deformation of 0.04% and a temperature-ramp rate of 5°C/min.

5. A surface protecting sheet according to claim 3 or 4, wherein the surface protecting layer contains at least one type of a free-radical polymerizable compound having two or more ethylenically unsaturated moieties in the molecule, the free-radical polymerizable compounds being selected from the group consisting of:

(1) (meth)acrylic-based low molecular weight compounds, selected from isocyanuric acid-derived (meth)acrylates, pentaerythritol-derived (meth)acrylates or bisphenol A-derived (meth)acrylates, which are crystalline or waxy at room temperature (20-25°C),

(2) urethane (meth)acrylate resins of molecular weight 10,000 or greater which are solid at room temperature (20-25°C), and

(3) the following resins having a molecular weight of 1000 or greater which are solid at room temperature (20-25°C): phenol-novolac epoxy (meth)acrylate resins, cresol-novolac epoxy (meth)acrylate resins and bisphenol A epoxy di(meth)acrylate resins.

6. A surface protecting sheet according to claim 5, wherein the surface protecting layer further contains a free-radical polymerization initiator.

7. A surface protecting sheet according to claim 3 or 4, wherein the surface protecting layer contains at least one cationically polymerizable compound having two or more cationically polymerizable groups in the molecule, the cationically polymerizable compounds being selected from the group consisting of:

(1) epoxy-based low molecular compounds, selected from hydroquinone diglycidyl ether or diglycidyl terephthalate, which are crystalline or waxy at room temperature (20-25°C), and

(2) phenol-novolac epoxy resins, cresol-novolac epoxy resins and bisphenol A epoxy resins of molecular weight 1000 or greater which are solid at room temperature.

8. A surface protecting sheet according to claim 7, wherein the surface protecting layer further contains a cationic polymerization initiator.